

Modeling of a Coastal River and Associated Floodplains

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Efforts to model coastal rivers are often complicated by a lack of the high quality information needed to produce a good mesh. The physical difficulty of surveying river banks, and the stage dependent nature of those banks, as well as the changing nature of the river bed, which is reworked by annual floods and major storm events, and the expense of bathymetric surveys in such systems, often renders it prohibitive to directly gather this information.

In an effort to overcome this limitation, a procedure has been developed to extract river bank locations based on aerial imagery at bank full conditions. A simple synthetic bathymetry has been developed as well, based on an idealized profile fit to the channel edges, which allows river depth to be estimated in areas where surveys are not available. Combining this river edge location information with the synthetic bathymetry and available topography, a high quality unstructured mesh can be generated covering the river channel and floodplains, allowing the modeling of in channel flow, flood events and intertidal processes.

These techniques are applied to generate a grid for the Pearl River in Mississippi and Louisiana from aerial imagery and a LIDAR derived DEM. The river is then modeled using ADCIRC and the resulting solution is compared to available data.